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CHINESE IRON-FOUNDRIES AND RICE-PAN CASTING.

As a notable example of the patient plodding industry shown by the Chinese, may be instanced the manufacture of the very thin cast-iron ricepans which may be seen in any cook-house in Hong-Kong. The principal seats of this industry are at the towns of Sam-tiu-chuk and Fatshan. The iron used is obtained by smelting magnetic oxide. The ore is broken up and smelted with charcoal in a very primitive smelting-furnace some eight feet high. The cupola is cone-shaped, having its apex at the bottom. The single tuyere pipe is of earthenware, the opening for the emission of the blast being inclined downwards. The furnace itself is of earthenware, strengthened by hoops and longitudinal straps of iron. The whole is lined with clay several inches thick. The internal diameter at the bottom is about two feet, and at the top three feet and a half; the inside depth being about six feet. The blast is produced by a rude bellows, formed of a wooden box five feet long, by three in horizontal, and a foot and a half in vertical section. This box is divided longitudinally into two compartments, each eighteen inches square in vertical section. In each of these compartments a piston works, the valves being so arranged that one piston is effective in the up, and the other in the down or return stroke. As there is no air-chamber, the blast is not perfectly continuous. The fuel used is charcoal; and the furnace, being first heated by starting a fire with fuel alone, is then filled up with alternate layers of charcoal and ore in small fragments. The blast is urged, and, after a sufficient time has elapsed, the molten metal is drawn off from a tap-hole at the bottom, and cast into ingots. These, when intended for export, are afterwards reheated in an open forge.

For making the very thin ricepans, which are cast without handles, pure iron of native manufacture alone is used. The moulds in which the pans are cast require weeks of tedious and patient labor to bring them to perfection. They are composed of two parts, an upper and a lower, and are made of carefully puddled clay. The great secret of the process which enables the Chinese founders to cast their iron pans of such large diameter, yet so thin and light as to be scarcely thicker than a sheet of paper, appears to be the use of highly heated moulds and pure charcoal pig-iron. When the ovens and their contents have cooled down, which takes about two days, the luting attaching the upper portion of the mould to the lower is carefully removed, and, the moulds being separated, the pan can be extracted. When the operation is successful, the same mould can be used several times. The pans now have each attached to its bottom a lump of iron, which, from the extreme brittleness of the pans, requires the greatest care in its removal. These runners are carefully sawn off, and the edges smoothed down; the pan is then ready for the export market. Handles are attached to these pans by the retail dealers.

From the *Journal of the iron and steel institute*.

The pans made at Fatshan differ from the preceding in being cast with handles attached near the rim to the inner surface of the pan, which necessitates the breaking of the mould at each casting. They are usually cast much thicker and heavier than those of Sam-tiu-chuk, and occasionally one-third of foreign pig-iron is mixed with the native iron for casting. In other respects the process followed at both places is the same.

GREAT ANTIQUITY OF THE AMERICAN RACES.

IN an article in the *Zeitschrift für ethnologie*, on the great antiquity of the human races, Dr. Kollmann takes American material to test his theory that the craniological varieties of mankind existed in quaternary times as they are found to-day. For this purpose, accepting the geological evidence of their antiquity as conclusive, he brings together observations and measurements upon crania from California, Illinois, Patagonia, central Brazil, and Buenos Aires. The first will be recognized immediately as the celebrated Calaveras skull. To the original measurements of Dr. Wyman, the author adds his own measurements taken upon Whitney's plate ('Auriferous gravels of California'), using for a term of comparison the heads of six Indians who visited Basle in 1882. He finds the Calaveras skull does not resemble European, but Indian crania in specific race-characters, which have persisted since the glacial epoch. The less familiar cranium from Illinois, known as the McConnel skull, was found enveloped in drift material in a cleft in a rock-bluff. It is now owned by Dr. Schmidt of Berlin, whose measurements are incorporated in the text with his conclusion, from a comparison of this skull with those in the collections at Washington and Philadelphia, that it is not unlike more recent long skulls from Illinois.

The rest of the study is based on material from South America. On the banks of the Rio Negro, Patagonia, in a stratum similar to that of the quaternary loess of the pampas, Moreno found two skulls which seem to him identical with existing forms. At the last Congrès des Americanistes, 1883, Lütken invited the attention of craniologists to the as yet unmeasured material representing the remains of thirty individuals, which Lund obtained in the cave of Sumidouro, near Lagoa Santa, Brazil. In a recent visit to Copenhagen, Dr. Kollmann measured four of the best preserved male crania, which, like one given by Lund to a Brazilian collection, and measured by Lacerda and Peixoto, are long, with broad faces. According to the latter authorities, they resemble the heads of Botocudos. The last of the group is one taken by Roth from the upper pampas formation of northern Buenos Aires. To Virchow, who took its measurements upon photographs, it recalled involuntarily the brachycephalic, prognathic skulls of Sambaquis. Nehring also stated to the Anthropological society of Berlin, that he has in his possession a Sambaqui skull from Santos, which presents a real resemblance to this.